Accepted refereed manuscript of: Ball C, Burt G, de Vries F & MacEachern E (2018) How environmental protection agencies can promote eco-innovation: The prospect of voluntary reciprocal legitimacy, Technological Forecasting and Social Change, 129, pp. 242-253. DOI: https://doi.org/10.1016/j.techfore.2017.11.004

How environmental protection agencies can promote eco-innovation:

The prospect of voluntary reciprocal legitimacy

Chris Ball, George Burt, Frans de Vries, and Erik MacEachern

Abstract

This paper examines the UK and Irish Environmental Protection Agencies (EPAs) ability to move beyond regulatory compliance to support and promote sustainable environmental innovation, in short "eco-innovation". To do so would require them to overcome the perception that they face, often being perceived as 'policemen' by the regulated business community. We propose a new empirically-derived theoretical construct called Voluntary Reciprocal Legitimacy (VRL), defined as the development of mutual trust between the regulator and business resulting in arrangements which generate eco-innovation benefits for the regulator, the regulated business communities and society at large. VRL adds a new category to Suchman's (1995) theory of moral legitimacy as well as highlights how EPAs can build trust between themselves and regulated business, allowing a shift of the 'beyond compliance' legislative boundary. Such an approach supports eco-innovation whilst simultaneously protecting the natural environment.

Keywords

Environmental protection agencies, environmental innovation, sustainability, voluntary reciprocal legitimacy, sustainable growth

Introduction

Credibility of Environmental Protection Agencies (EPAs) in pursuing environmental regulatory activities is governed by its legitimacy. This legitimacy can be seen as increasingly important in view of the recently enhanced role of British and Irish EPAs in relation to promoting eco-innovation and sustainable economic growth within their jurisdictions (SEPA, 2014; Environment Agency, 2015). For example, the Regulatory Reform (Scotland) Act 2014 (section 51) recognises that protecting and improving the environment (including managing natural resources in a sustainable way) has high potential to contribute to improving the health and well-being of people, and to achieving sustainable economic growth, thus acting as a further stimulant to eco-innovation (SEPA, 2016). Discussion of the legitimacy of EPAs focuses on two elements: procedural and consequentialist legitimacy (Suchman, 1995). Procedural legitimacy relates to the propriety of processes by which environmental regulations and policies are determined and implemented, and applies to whether environmental regulation is best made by government actors (Eden, 1999) or by non-state market actors (Cashore, 2002; Carmin et al., 2003). In addition, there follows the question of how environmental regulation has been institutionalised and legitimised in a particular context (Francesch-Huidobro, 2012). Consequentialist legitimacy concerns the extent to which these regulations are successful in achieving their goals (Eckersley, 2007).

Sustainable-orientated innovation (henceforth *eco-innovation*), combining motivation and performance producing environmental benefits (Oltra et al, 2010) is regarded as critical to achieving sustainable economic growth. For instance, Adams et al, (2015) argue that

moving from incremental sustainable innovation to system-building, "beyond firm" innovation involves a paradigm shift that will entail "intimate, interdependent collaboration between previously unconnected actors, such as NGOs, industry associations and economic development organisations" (p.193). Collaboration between regulators and business is, therefore, necessary to support the movement towards more radical environmental innovation underpinning sustainable economic growth (Berry and Rondinelli, 1998).

Despite the desire for environmental well-being in societies, environmental regulation can often encounter resistance due to regulators lacking legitimacy in face of suspicions of "Big Government" and fears that regulation contradicts and limits the achievement of economic goals and growth (Herbert, 2014; Francesch-Huidobro et al., 2012). The suspicion of "Big Government" is about procedural legitimacy, to do with the regulatory process, in this case, relating to whether the government is the right actor to regulate and whether it has excessive power in regulation (Eden, 1999). The consequentialist stance on legitimacy considers the success with which intervention leads to positive environmental outcomes as a crucial part of the legitimacy of environmental regulation and policy (Eckersley, 2007), with judgements about the contribution of interventions and institutions to solving environmental problems necessary (Kronsell, 2013). Moreover, consequentialist legitimacy can be extended to consider the impact of intervention on sustainable economic growth (Herbert, 2014).

The economic impact of environmental regulation is linked to a body of research examining whether such regulation induces or stifles innovation in regulated industries (Porter and Van der Linde, 1995-a; Kesidou and Demirel, 2012; Wagner, 2003; Ambec et al, 2013; Allan et al., 2014; Cohen et al., 2013). Although under Suchman's (1995) institutional perspective, an organisation's legitimacy is socially constructed by its context, he argues that an organisation can manipulate its context to acquire legitimacy. This suggests that EPAs can take action to manage procedural and consequentialist legitimacy and, in so doing, legitimise their eco-innovation activities beyond regulatory compliance.

The literature on the legitimacy of environmental regulation, procedural legitimacy and consequentialist legitimacy are often considered separately (Eckersley, 2007). Research on the legitimacy of environmental regulation is more concerned with the procedural legitimacy of regulation, in terms of regulatory processes and policy design (Cashore, 2002; Eden, 1999; Francesch-Huidobro, 2012; Herbert, 2014). However, processes that are effective in engaging stakeholders are of little value if few tangible outcomes are delivered by them in terms of achieving positive environmental outcomes for society. In other research, more directly concerned with the impact of environmental regulation on innovation within firms, there is greater orientation towards the outcomes of environmental regulation in achieving sustainable economic growth, thus the rationale for consequentialist legitimacy of environmental regulation (Porter and Van der Linde, 1995-a; Kesidou and Demirel, 2012; Fischer et al., 2003). Conversely, outcomes in terms of

regulations effectively stimulating environmental innovation can be undermined by poor policy design and limited stakeholder involvement.

Few studies consider both forms of legitimacy explicitly in parallel which is intriguing given that they appear to be counterparts of each other (Eckersley, 2007; Kronsell, 2013). In this paper, it is argued that harnessing both procedural and consequentialist legitimacy simultaneously is of crucial importance for EPAs if the pursuit of their activities aimed at stimulating eco-innovation and sustainable economic growth requires resources from social groups, such as consent from the (regulated) business community, public agreement and governmental backing (Suchman, 1995). This legitimacy may partly depend on whether regulation is legitimated and institutionalised in the context in which they operate and on the attempts of regulators to forge legitimacy to further their own strategic needs (Francesch-Huidobro, 2012). If EPAs are to be successful in the pursuit of activities to stimulate eco-innovation and sustainable economic growth, they should harness procedural and consequentialist legitimacy in order to gain support and resources from the businesses that they regulate as well as government.

Given the complexity and tensions identified in the literature – seeking collaboration yet suspicion of regulators, desire to support eco-innovation yet power dynamics between the actors, and the desire to create beneficial outcomes for environment, society and businesses, this paper examines the relationship between procedural and consequentialist legitimacy for EPAs. It is based on three empirical sources (i) a Pan-European EPA benchmarking exercise to identify current practices that support eco-innovation, (ii)

interviews with senior executives of the UK and Irish EPAs as well as representatives from business support agencies, and (iii) insights from a multi-stakeholder workshop involving EPA representatives from Scotland, England, Wales, Northern Ireland and the Republic of Ireland. It aims to explore the extent to which UK and Irish EPAs acquire procedural and consequentialist legitimacy in the pursuit of activities to promote eco-innovation and, therefore, sustainable economic growth.

This paper responds to the separation of procedural and consequentialist legitimacy in the literature by exploring how EPAs can gain, moral legitimacy through stimulating and supporting eco-innovation activities by the industries and businesses they regulate. The new empirically-derived construct introduced in this paper – Voluntary Reciprocal Legitimacy (VRL) – extends our understanding of the theory of moral legitimacy proposed by Suchman (1995). The VRL construct encapsulates the ways in which EPAs acquire both procedural and consequentialist legitimacy to advance their activities in promoting eco-innovation and, therefore, sustainable economic growth in ways that go beyond their regulatory compliance role. Procedural legitimacy is concerned with the nature of the processes of engagement between the EPA and regulated organisations to support eco-innovation. Consequentialist legitimacy is concerned with the extent that the outcomes of the processes of engagement promote beyond compliance that protects and improves the natural environment, and simultaneously creates sustainable economic growth and well-being benefits (Suchman, 1995). In doing this, VRL will contribute to the reconciliation of legitimacy concepts that may be useful for environmental regulators in view of their pursuit of eco-innovation and sustainable growth.

The rest of the paper is set out as follows: next we discuss legitimacy theory – procedural and consequentialist – and its relevance to environmental regulation and eco-innovation; we then discuss the research context, data gathering and data analysis; we then present our empirical findings; this is followed by a discussion of the proposed new theoretical construct: VRL; finally we draw out conclusions including implications for policy and practice.

Legitimacy theory and its application to environmental regulation

In this section we will, firstly, discuss the evolution of the literature on legitimacy within the debate on environmental regulation and, secondly, focus more closely on the complexities of procedural and consequentialist legitimacy, drawing on Suchman's (1995) seminal work on legitimacy theory. Suchman (1995) describes legitimacy as:

> "[…] a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values beliefs and definitions" (p 574).

Suchman (1995) argues that legitimacy enhances the durability of an organisation, as it is more likely to gain resources from social groups (and society more broadly) if its activities are perceived in a positive manner. This, of course, may matter less for organisations that do not require resources from social groups; it may only be important to those organisations in that they do not lose their right to operate. Suchman (1995)

identifies three different forms of legitimacy: pragmatic, moral and cognitive legitimacy. Pragmatic legitimacy stems from whether the organisation's activities can meet the self-interested needs and motivations of its "immediate audience" (p.579) (e.g., shareholders). Moral legitimacy is about whether the organisation's activities are regarded as being accepted by society, whereas cognitive legitimacy involves the acceptance of an organisation being self-evident and not subject to issues which involves the interests of different groups, or the evaluation of its activities from a moral perspective (see figure 1 below highlighting the perceived distinction between procedural and consequentialist legitimacy). Procedural and consequentialist legitimacy, as mentioned above, belong to moral legitimacy and form the focus of this paper.

[Insert figure 1 about here]

Suchman (1995) further differentiates between institutional and strategic views of legitimacy, with the institutional lens being outside-in, whereby factors in an organisation's context shape its legitimacy, such as the political climate and prevailing social norms. In contrast, the strategic lens is inside-out, where an organisation attempts to shape its context to acquire legitimacy. The strategic lens refers both to how firms acquire moral legitimacy through improving their environmental performance and the way that regulators can acquire legitimacy for their "beyond compliance" activities to promote eco-innovation. Intriguingly, this distinction between institutional (outside-in) and strategic (inside-out) legitimacy is not made explicit in either the literature on environmental regulation or in the literature that examines the relationship between regulation and eco-innovation. However, it is an important distinction. Whilst regulators

and businesses may have little influence on institutional legitimacy, Suchman's theory suggests that they can gain procedural and consequentialist legitimacy through using strategic legitimacy. Yet this is not evident in the literature (see figure 2 below that links procedural and consequentialist legitimacy). We will now discuss procedural and consequentialist legitimacy in more detail in the context of environmental regulation.

[Insert figure 2 about here]

Procedural legitimacy in environmental regulation

The procedural legitimacy of environmental regulation concerns the appropriateness of the policy implemented and/or the regulatory process. Procedural issues featured in the literature involve which actor is the most appropriate to engage in regulatory functions? (Cashore, 2002; Eden, 1999; Herbert, 2014); how the regulatory process is managed politically across central and local governments as well as citizens? (Francesch-Huidobro, 2012; Kronsell, 2013; Herbert, 2014); and strategically with a wider range of other stakeholders (Carmin et al., 2003) where eco-innovation is a contested space? (Franceschini and Pansera, 2015).

The issue of who has legitimacy to engage in environmental regulation may rest on perceptions of competency, based on "technocratic rationality" (Eden, 1999) and possible suspicion of excessive government intervention (Cashore, 2002; Herbert, 2014). Eden (1999) is sceptical about the business community's legitimacy in regulating itself in environmental matters. She states that business associations place their legitimacy claims

on the argument that they have technocratic rationality; they are objective (as they are "apolitical") and have relatively stronger expertise in dealing with environmental regulation compared to policymakers who implement this. However, although they may possess this expertise, Eden (1999) casts doubts on the industry and business objectivity claims given the economic interests they are charged with protecting. Moreover, Eden argues that this technocratic rationality argument is often used by the business community to dominate the "environmental debate" and, more importantly, to exclude other constituent groups such as NGOs and citizens. Moreover, corporations internally often face competing goals and interests, implying that decision-making is not necessarily rational and, subject to learning (Simon, 1972; Simon, 1991). That is, in the presence of boundedly rational behaviour and myopia in organizational learning, biases in businesses' strategic decision-making are likely to emerge (Levinthal and March, 1993), hence undermining technocratic rationality.

Cashore (2002) suggests that this movement in favour of transferring control over regulation to "non-state market actors" stems from a suspicion of excessive government intervention, as this transference gives such non-state market actors the moral legitimacy to regulate the industry supply chain. Prominent examples of this regulation by non-state market actors are the forestry certificate programmes which emerged in response to boycott initiatives against the forestry industry, with these certificate programmes reliant on moral legitimacy conferred on them by environmental groups (Cashore, 2002). This aversion to "Big Government*"* is also discussed in Herbert (2014), where he argues that it is due to the perception and dislike of the "coercive role" (p.1792) of big government.

Cultural contexts may be conducive to non-state market actors enjoying greater moral legitimacy in environmental regulation compared to government bodies. Both expertise and the political climate, namely the degree to which there is tolerance for government intervention, are important factors in determining which actor has legitimacy to engage in environmental regulation. It is, therefore, key to consider how this tension might be resolved. As mentioned before we will explore this tension by taking a three step research approach: Pan-European EPA benchmarking, one-to-one interviews with senior EPA executives, and a multi-stakeholder workshop.

The process of making and implementing regulation is a core aspect of the procedural legitimacy of environmental regulation. Francesch-Huidobro (2012) stresses the need for political and institutional capacity, highlighting how the absence of both of these elements hampered the institutionalisation and legitimation of climate policy in the case of Hong Kong. She describes the public institutions that are responsible for establishing and implementing a climate plan, emissions targets and the regulation of environmental issues as "deficient". In another article, based on the Chinese city of Guangzhou, Francesch-Huidobro et al. (2012) suggest that it is often inter-institutional complexities, involving difficulties of public institutions working together, that frustrates implementation. This is compounded by the resistance on the part of the business community in Hong Kong to environmental initiatives. If non-state market institutions do not have the capacity to formulate policy properly, then it is difficult to gain stakeholder buy-in and, therefore, political legitimacy for regulation and policy

(Francesch-Huidobro, 2012). Likewise, Kronsell (2013) discusses the building of political legitimacy of climate policies through citizen engagement in policy formulation. She cites the Green City of Freiburg as an example of strong procedural legitimacy in which there is both strong citizen engagement in climate policy and cross party support behind a form of "Green Conservatism" which reinforces the political legitimacy of environmental regulation. Wesselink et al. (2011) support this view, arguing that public participation in environmental policy making and governance reinforces legitimacy through making use of local knowledge and engaging groups normally excluded from policy making. In terms of strategic procedural legitimacy, Carmin et al. (2003) discuss voluntary environmental protection agreements of U.S. companies and claim that they can enhance their moral legitimacy if they involve stakeholders (e.g. environmental NGOs) in the design of relevant programmes. Gaining moral legitimacy for these agreements may prove important in avoiding negative action against a business, such as boycotts. However, to the best of our knowledge, there is little empirical evidence to highlight how voluntary agreements may enhance moral legitimacy of the key actors involved.

Consequentialist legitimacy in environmental regulation

In the economics and management literature on regulation and eco-innovation, a typical focal point is the degree to which regulations are efficient and effective in inducing compliance and environmental innovation within regulated industries. Porter and Van der Linde (1995-b) challenge the notion that environmental regulation is a burden per se arguing that such regulation can lead to "innovation offsets" within firms whereby improvements in resource productivity outweigh the initial costs associated with the

regulation. They discuss "innovation-friendly regulation", suggesting that regulation that encourages experimentation and risk taking, that is pre-emptive, that is flexible and that contains market incentives is more likely to be effective in stimulating eco-innovation.

Kesidou and Demirel (2012) study this hypothesis empirically in the context of UK firms, finding that there is a "dual impact" of regulation at both ends of the spectrum. They state that only the least and most innovative firms are driven by regulatory requirements. Least innovative firms may need to take action in response to the regulation in order to be compliant whereas highly innovative firms may perceive the regulation as an opportunity to gain first mover advantage in the market place. Kesidou and Demirel (2012) find further that there is little evidence to support the view that firms make investments in eco-innovation in response to societal pressures which points to the necessity of regulation to galvanise action on the part of firms. This finding in relation to the influence of societal pressure on eco-innovation also weakens the strategic view on legitimacy, whereby firms undertake eco-innovation in order to gain moral legitimacy from audiences in their context. Bansal and Clelland (2004) highlight how the U.S. EPA influenced investors' assessments of environmental legitimacy by releasing firms' toxic release data. Similarly to Kesidou and Demirel (2012), they do not suggest that this raising of stakeholder pressure on firms strongly induces eco-innovation; they claim, rather, that firms can manage poor environmental legitimacy through making a commitment to the environment or through engaging in public relations activities, instead.

Within the field of economics, the discussion of environmental regulation focuses on which type of regulatory instrument is the most economically efficient; in other words, which instrument is most cost-effective in delivering the best eco-innovation outcomes. For instance, Fischer et al. (2003) state that decisions about the right type of environmental regulation will depend on the economic and environmental context. They argue that the decision to adopt taxes or permits will depend on the slope of the marginal benefit curve from environmental innovation, if marginal benefits from additional environmental innovation fall away rapidly (the slope is steep), then abatement costs will be excessive under a tax and a market-based instrument, such as pollution permits, should be used. Wagner (2003) argued that market-based instruments which foster incentives for innovation and, even, voluntary agreements are preferable whereas Allan et al. (2014) argue that market-based instruments and more traditional regulation affect the diffusion of green technology differently. Reviewing literature on environmental regulation and innovation, Allan et al. (2014) reveal that regulations were important in driving the adoption of end-of-pipe technologies, such as pollution control mechanisms, whereas market-based instruments tended to shift companies towards more cost-efficient compliance methods. Polzin et al, (2016) consider the relationship between financial intermediaries and regulation that help or hinder eco-innovation. This highlights the need to assess the trade-off between costs and environmental benefits in designing regulations.

Kronsell (2013) argues that both procedural and consequentialist legitimacy are contingent upon one another. In the case of Green City Freiburg, the procedural legitimacy is dependent on achieving positive environmental outcomes. Without positive

environmental outcomes, political and citizen support would be jeopardised. Likewise, consequentialist legitimacy relies on procedural legitimacy, in the form of active citizen engagement in policy formulation and political consensus behind the green city plan. It is possible for limited procedural legitimacy to be compensated by high output legitimacy, but, in the case of Freiburg, there was a high level of both. An imbalance in legitimacy can be problematic and misleading according to Eckersley (2007). So, given the lack of clear evidence to support eco-innovation, the question arises as to how procedural and consequentialist legitimacy might be harnessed simultaneously by EPAs to support eco-innovation?

Research context, method and empirical findings

Research context

The nature and focus of the project involved the English, Welsh, Scottish, Northern Irish and Republic of Ireland EPAs. Moving beyond regulation to support eco-innovation and sustainable economic growth is beyond the legislative frameworks that underpin the legitimacy of these organisations. By jointly commissioning the project – Share109 work stream – the participating EPAs wished to explore potential opportunities for collaboration and learning around the theme ‘eco-innovation’. The multi-stakeholder and exploratory nature of the research with EPAs representing different geographies, different legislative frameworks, and different priorities provided a unique opportunity to conduct research to explore the “beyond compliance” issue (Yin, 2009). The agreement to engage in this multi-stakeholder project offered the opportunity to explore alternative views and

perspectives that would enable the research team to gain insights into common potentialities as well as barriers to achieving any such potentialities.

Data acquisition

A multi-method approach to data gathering was developed given the range and scope of empirical sources (Flanagan, 1954; Tremblay, 1982; Miles and Huberman, 1994; Symon, 1998; Butterfield et al., 2005). The research project comprised three phases of data gathering. First, a Pan-European and pan-UK/Republic of Ireland benchmarking exercise; second, one-to-one interviews that were conducted with Chief and Senior Executives from across all of the participating EPAs; third, a two-day workshop which was held with thirteen representatives from all of the participating EPAs and business support agencies. Each phase is discussed in more detail next.

The first phase was a Pan-European and pan-UK/Republic of Ireland benchmarking exercise, which was designed to understand current developments around eco-innovation in the EU. The EU was selected as it has an explicit agreement to be a key driver and global leader in environmental management practices (EU Climate and Energy Framework, 2030). In phase 1 of the project data was gathered from a wide range of websites, including EPAs in and outside of Europe, as well as the participating UK and Irish EPAs. In addition, key databases such as that provided by the EU Network for the Implementation and Enforcement of Environment Law (IMPEL) were carefully examined. Also in the first phase each of the UK and Irish EPAs were benchmarked against each other. By benchmarking, the intention was to highlight insights into how the

participating EPAs might promote eco-innovation to support sustainable economic growth.

The second phase comprised fourteen one-to-one interviews that were conducted with Chief and Senior Executives from across all of the participating EPAs to seek their views about eco-innovation for sustainable economic growth. The interviews followed a set of open-ended questions (see below) which were designed to facilitate a conversation that would be emergent in nature. Each interview was recorded verbatim and lasted 45-60 minutes. During the interview the interviewer summarised key issues to both seek confirmation of understanding as well as to provide a reflective moment for the interviewee (King, 1994; Bray, 2000).

The interviews were semi-structured in nature (Seidman 1998, Lincoln & Guba 1985), consisting of five open questions, based around themes that emerged from the previous literature review and desk research stages. Initially, the One Planet Living Framework (Bioregional, 2016) was introduced to explain the context of the research to the participants. This framework is intended to help organisations analyse the "sustainability challenges faced, develop appropriate solutions and communicate the actions being taken to key stakeholders" (Bioregional, 2016). Respondents were initially asked an open question about what they understood the general role of regulatory agencies to be in promoting sustainable economic growth. This question would elicit perceptions relating to the boundaries and scope of environmental regulators' interventions in the promotion of sustainable economic growth. The second question related to how environmental regulators could promote sustainable organizational innovations. These innovations

corresponded to environmental management systems, such as ISO14001 and measures to improve the sustainability of supply chains – indirect mechanisms to change behaviour in regulated firms. Respondents were then asked about more direct interventions, primarily environmental regulations designed to stimulate more sustainable business decisions, such as pollution control measures, for example. Question four related to more radical approaches that regulators could take, namely promoting incubators for green entrepreneurs and promoting the development of export markets for environmental innovations created by regulated firms. Towards the end of the interview, a more open-ended question was asked about the future possibilities that regulators could pursue in light of current trends – this question would look forward to potential developments in the next few years.

These questions were derived from the literature review (refer to the Interview Guide at Appendix 1). Question two was inspired by the organizational innovation category of Oltra, Kemp, and de Vries (2010) which refers to environmental management and audit mechanisms intended to improve within-firm sustainability. The discussion about the types of regulatory instrument which are more effective at stimulating innovation (Fischer et al, 2003; Kesidou and Demirel, 2012; Porter and Van der Linde, 1995-b) influenced question three. Question four about technology development and green entrepreneurship was derived from this concept around sustainable innovation at the system level compared to more reactive, incremental innovation (Adams et al, 2015). Question five was forward looking, concerned with the current and future trends and developments in environmental regulation. It is was inspired by the existence of the

OECD's Green Growth policy, encouraging governments of advanced countries to link environmental and economic reforms to ensure a sustainable economic recovery, with the help of specific indicators to measure progress towards this Green Growth (OECD, 2015; OECD, 2017).

The questions were designed to stimulate discussion about the role of the participating EPAs in bringing forward the more incremental sustainable innovations as well as the system-oriented "beyond-firm" innovations (Adams et al., 2015). Prior to the interviews with the senior executives of the EPAs, a pilot interview was conducted with a retired senior manager of an EPA. This pilot interview was subsequently used to test the dependability and credibility of the interview schedule (Guba and Lincoln, 1981). This process also helped to both sharpen the questions and gave rise to further issues for exploration in subsequent interviews, in particular, the importance of moving from prescriptive to more sophisticated regulation was emphasized in this pilot interview.

The third phase involved a two-day workshop which was held with thirteen representatives from all of the participating EPAs and business support agencies (Scottish Enterprise and Highlands and Islands Enterprise) to share and explore the findings of the research derived from phases 1 and 2. Two of the representatives had been interviewed under phase 2. The workshop was designed to provide time and space to identify areas for common development (Flanagan, 1954; Butterfield et al., 2005) and opportunities to go beyond compliance with respect to supporting eco-innovation initiatives.

Data analysis

The benchmarking exercise in the first phase identified two main themes: (i) efforts to support *beyond* compliance, and (ii) efforts to *improve* compliance. In the first of these two themes commonalities across the benchmarked agencies included: (i) variation in support for eco-innovative technologies, (ii) focus on development of export markets, (iii) requirement for sustainable procurement, and (iv) creating demand for eco-innovations. In the second theme commonalities across the benchmarked agencies included: (i) pre-emptive regulations, (ii) regulatory design and (iii) information policies. The evolution and focus differed between the benchmarked EU regulatory agencies, with Denmark consistently ahead of the participating agencies with initiatives to support eco-innovation. The research themes identified from the desk-research were confirmed and enriched at the workshop stage.

All interview data gathered in the second phase were transcribed and analysed, key themes were identified and coded by the interviewer; codes are "labels that assign symbolic meaning to the descriptive inferential information compiled during the study" (Miles et al., 2014, 71). The interview guide was directed by the main concepts featured in the literature review and refined following the pilot interview. To ensure inter-coder reliability, namely whether members of the research team would code the data in a similar way (Campbell et al., 2013), a sample of transcripts was sent to a member of the research team for independent coding. The two sets of interview codes and themes were then reviewed by a third member of the research team, from which a stable set of codes emerged. Following the interview and workshop stages of the data collection, first order

codes were applied to the empirical data (Saldaña, 2015, Miles et al., 2014). Typical codes which emerged at this stage included: (i) tension between roles of the regulators (ii) perceptions of regulation as burdensome (iii) experimentation and flexibility (iv) engagement with businesses, (v) 'policeman' role, (vi) showcasing best practice (vii) market credibility through accreditation and (viii) supporting exports.

The members of the research team immersed themselves in the data from the interviews and workshop and subsequently reflected on the first order themes, making memos to explore these themes and find underlying patterns (Denzin & Lincoln, 2000). In reviewing these first order codes, it became apparent that a transcending theme was "legitimacy", based on Suchman's (1995) concepts explained above. In this respect, procedural legitimacy related to the codes to do with what was "proper" for a regulator to do, in view of its role, and this would relate to the codes about role tension, whether regulation was burdensome and the 'policeman' role. Consequentialist legitimacy related to the codes about the effectiveness of the regulators' activities in promoting 'beyond compliance', corresponding the themes relating to experimentation, engagement with regulated businesses and supporting exports.

The data was re-considered in light of this 'legitimacy' framework, which led to the emergence of the following overarching patterns: (i) boundary scope (ii) partnership working and (iii) institutional-strategic influence. From these higher-order codes, the theoretical construct of voluntary reciprocal legitimacy was developed.

In phase three of the project an independent research observer captured in vivo comments from participants throughout the workshop as they discussed the findings from phase 1

and 2. These comments were analysed for critical incidents, initially based on the level of discussion as well as the level and diversity of views surfaced in the workshop (Flanagan, 1954; Butterfield et al., 2005). These were discussed outside of the workshop to develop a deeper understanding of the significance of each critical incident. Workshops effectively provided an opportunity to explore and confirm/disconfirm data from the interview stage and, therefore, enhanced the generalizability of the research findings (Denzin and Lincoln, 2000).

The analysis of the workshop data, including critical incidents and reflective notes revealed three major inter-related findings. The first finding related to questioning the role and limits of the regulator. The legislative framework and the priority of Government to either support eco-innovation or limit the nature of regulation is decisive in determining the scope enjoyed by the regulator. The second finding related to the extent to which EPAs work with other agencies could support beyond compliance. A challenge for the EPAs in seeking partnerships is the need to avoid straying into the domain of the partner. The third finding related to the relationship between 'institutional (outside-in) and strategic (inside-out) influences' and how these help or hinder the EPAs in encouraging and supporting eco-innovation. We present a summary of the data analysis from the three sources of empirical evidence to highlight the major common themes emerging from the data analysis. After reviewing the data from the various phases, three major inter-related themes were identified: "boundary scope", "partnership working", and "forces driving eco-innovation". Table 1 below provides a summary of these common themes.

Common theme	Benchmarking	Interviews	Workshop
Boundary scope	Encourage and influence sustainable procurement in supply chains	Interpretation of regulatory reform agenda and how far to stretch	Role and limitation of regulator
Partnership working	Regulator support to develop export markets in conjunction with trade development body	Flexibility and experimentation with new initiatives with business development agency	Partnership working to support beyond compliance
Forces driving eco-innovation	Regulator support for eco-innovation technologies	Conflict between regulatory and compliance-plus roles	Mechanisms available to support eco-innovation
	Create demand for eco-innovation	Level of engagement with business	
		Showcasing examples of good practice	
		Approach to contributing to eco-innovation	

Table1: summary of common themes

Findings

We now discuss thee three findings in more detail, with empirical exemplars, including empirical exemplars from phases one, two and three, as these are central to the development of our contribution. Interview respondents from the second phase have labels RA if they come from a regulatory agency, and BSA if they come from a business support agency.

Boundary scope

A number of critical incidents arose during the workshop (which on reflection the issues were also noted in the semi-structured interviews). First, was the questioning of the "remit of the bodies" and the "extent of impartiality of the regulator". This issue was also identified in the interviews noted above, the conflict between regulatory and compliance and the integrity of their role. One exemplar conversation between participants was:

> "Are the regulators active in the promotion of a particular technology? Are the regulators supporting the comparative advantage of their country?"

This conversation led into the 'boundary scope' of the regulator. This concept raises the issue of what is the legitimate sphere for regulatory compliance and going beyond compliance. Extending the critical incident above, the participants went onto further discuss the role of the regulator covering the relationship between banks, eco-innovation equipment manufacturers who supply and export their equipment, and the regulator who certifies the equipment. The banks provided investment funding and export support, and the regulators who certified the equipment indirectly promote it.

During the workshop a clear difference emerged between the UK and Irish EPAs about the constraint of and requirement to work within the relevant country's legislative framework. In particular, these legislative frameworks differ across the geographic domains. There was a clear split between those domains that facilitated beyond compliance but within the legislative framework, and other domains which were more restrictive. The more restrictive legislative frameworks were based on ensuring that the

minimum regulatory compliance met without imposing unnecessary cost or bureaucracy on a business or industry. The domains which facilitated beyond compliance but within the legislative framework encouraged the regulator to work closely with regulated businesses to help them become more efficient, for example, by reducing waste.

Two key insights emerged in this phase. First, 'beyond compliance' activities were undertaken within the domain-specific regulatory framework, and, second, there was a perceived tension within the EPAs on how their role may be perceived: inhibiting businesses growth or supporting achievement of business objectives. The overall conclusion was succinctly noted by one of the participants:

> "Trust, how do we gain it? How do we improve engagement? There seems to be so many barriers for the regulator. What is the balance between regulatory activities and non-regulatory methods, for example, a planning role, a science role, a community engagement role? How do we develop a soft influence?"

Here we see the issue of 'boundary scope' as a major consideration. As one participant commented:

> "We have a dichotomy as we have to have a 'policeman role' with a desire to have a 'business support role'".

In one of the interviews this theme was mentioned by interview respondent BSA-1, likening the tension of this dual role with that of:

"…. a policeman giving you advice whilst you are breaking into a house".

As one workshop participant commented:

"The primary role is preventative, prevent resource decline and conserve wealth."

The level of engagement with sophisticated businesses, with mature practices and processes, also raises 'boundary scope' issues. First, it requires the EPA to develop a detailed understanding of the economics of the regulated industry and market environment that they wish to engage with. Without such knowledge and understanding there would be a credibility barrier to working with the management team in the (particular) industry. This point about credibility was emphasised in the interviews which indicated a need to overcome negative associations of environmental regulators, with respondent RA-4 commenting:

"There is a need to get a negative public image, need to change image to show that *we* are not a bunch of tree-huggers".

Whilst large and sophisticated organisations are confident in dealing with health and safety and environmental regulatory bodies, the workshop identified that there is a tension with the regulator providing business support on the one hand, being a regulator (e.g. the policeman role) on the other hand, and simultaneously supporting eco-innovation. This is even more pronounced when the participants discussed the small and medium sized enterprise (SME) level.

Partnership working

One area that emerged from the interviews that showed potential for going 'beyond compliance' was partnership working. This covers inter-agency partnerships between EPAs and other agencies. It was recognised that the inter-agency partnership could support three common areas: (1) sharing best practices, (2) collaboration on existing framework projects, and (3) experimentation to develop new projects and initiatives. One example from the workshop that highlights the tension for the EPAs in all three areas to partnership working was noted when one participant commented:

> "We work within our legislative framework, so how do we develop new markets? Is it directly to drive eco-innovation or indirectly to create markets through facilitating dialogue?"

In supporting eco-innovation, EPAs implemented so-called Environmental Technology Verification (ETV) schemes. An ETV is a voluntary approach to support technological innovations and is designed around eight steps, covering initial eligibility assessment, ETV proposal, technology description, technology performance, verification agreement, verification protocol, assessment and final report. However, it does not fulfil the desire to go 'beyond compliance'. As one participant noted:

> "The pre-commercialisation stage is the key (primarily step one with links to steps two and three), yet the ETV protocol engagement between key parties is lacking".

This insight that the ETV protocol engagement is lacking indicated a feeling that regulated businesses are not fully aware of the value of this mechanism, which could potentially improve their market credibility among adopters of their technology, including customers and governments. The ETV programme is an example of the potential for effective partnership working between the EPAs and firms which directly helps innovative technologies to reach the market (within the legislative framework). Interview remarks also reflected the collaborative role that EPAs and firms could enjoy, with EPAs as enablers, with respondent RA-3 stating:

> "The regulator shouldn't be viewed as a barrier to development; it should be approached at an early stage about permits and licencing".

Similarly, respondent RA-4 highlighted the way that Prosperity Agreements could help:

> "…anticipate problems before they happen, moving away from the '*tick box*' idea to the more strategic approach".

Institutional-strategic influences

Institutional influences cover a wide range of factors that shape the legitimacy of EPAs. Whilst pursuing the same end goals of environmental protection and maintaining environmental resources, as well as supporting the replenishment of these resources as they are used, the outside-in factors were distinctly different between the UK and Irish

EPAs context. The outside-in factors ranged from supportive and facilitating legislative frameworks to restrictive and constraining legislative frameworks. For example, in one jurisdiction the 'one planet living' with its ten guiding principles has been an underpinning philosophy (Bioregional, 2016).

The tension between the legislative frameworks was clear when one participant commented: "We want to make our message clear by adopting the principles of sustainability of natural resources". Yet a participant from another jurisdiction commented that the "grand narrative message from Government was no gold plating" to ensure there were no restrictive burdens on the business community as economic growth was the priority as part of the regulatory reform agenda. Additionally, there appeared to be a clear boundary separation between EPAs where each agency can have different focal points and priorities.

Strategic influence recognises the ambition, ability and actions of EPAs to go beyond compliance and support eco-innovation. For instance, through setting up a voluntary programme (such as the aforementioned ETV), an EPA could gain greater moral legitimacy, which could facilitate the development of trust. Indeed, there was a suggestion in the interviews that regulators could use their position of status to aid businesses develop export markets, furthering this strategic influence, with BSA-2 stating:

> "It could provide feedback for Scottish companies and 'open doors' for export opportunities, as SEPA is trusted it has a higher status".

Whilst there were moments where the workshop offered varied views on the strategic aspect of going beyond compliance, it did not receive an enthusiastic reception. One participant asked the question: “Is this approach benchmarked across UK EPAs, across EU EPAs, and did it create a comparative advantage?” This skepticism and tension for EPAs was further reflected when one participant noted that “political commitment was vital in developing the Environment Bill which provides the well-being of future generations as a unique foundation”.

There were two notable exceptions to this situation. The first is the Vision in Business for the Environment of Scotland (VIBES), which is an annual recognition and reward system for large organisations as well as start-ups and SMEs that are engaging in eco-innovation. The second is Northern Ireland’s voluntary ‘Prosperity Agreements’ implemented in 2014, designed to help the EPA and businesses to explore opportunities to reduce environmental impacts in ways that create prosperity and well-being. Here outcomes are discussed and agreed between the regulator and the regulated businesses. These prosperity agreements are intended to balance compliance and beyond compliance, and to change business perceptions towards sustainability. Both of these exceptions can be considered as “innovation inducing mechanisms” (Lim and Prakash, 2014, p 234). Within the interviews, it was stressed that, in order to play an enabling role in innovation, regulators had to embrace more constructive instruments to trigger sustainable innovation, with respondent RA-7 discussing the need for different ways of motivating firms than traditional regulations:

> "…direct regulations prevent people doing the wrong thing, but they are ineffective at getting people to do the right thing".

The VIBES Awards and Prosperity Agreements embody more constructive and sophisticated enabling mechanisms.

Towards a voluntary reciprocal legitimacy framework

The findings derived from the three sources of empirical evidence revealed a tension for EPAs as they search for means to move beyond compliance with regulation and to promote eco-innovation. On the one hand there is a need to maintain their integrity and impartiality to act as a regulator to ensure – and when required enforce – compliance. On the other hand, some EPAs have the aspiration to support eco-innovation as a strategy to support sustainable economic growth and environmentally driven entrepreneurship. Would striving for the latter impact on the former? If EPAs are recognised primarily as a regulator by the industry/public, how would they be perceived in their intent to support eco-innovation, which may benefit industry with potential benefits to society at large? The dialogue from all of the EPAs emphasised the importance of meeting their regulatory responsibilities, but also acknowledged that there were varying contextual constraints and support that influenced their role and ability to effectively stimulate and pursue eco-innovation. We will discuss regulatory-scope limitations, beyond regulatory-scope limitations, and theorizing VRL next.

Regulatory-scope limitations

At one end of the regulatory-scope spectrum there was a constraining political, legislative and public funding context that signifies governments' classic view of regulation being (potentially) burdensome and a 'cost' to business. At the other end of the spectrum was an enabling legislative context that aims at promoting environmentally benign business and industry activities, such as stimulating eco-innovation. Regardless of the end of the spectrum that the UK and Irish EPAs are located, the current legislative frameworks impose a constraint, or boundary-scope limitation, on the EPAs ability to pursue regulatory activities that are beyond their enforcement and compliance role. This constraint is both legislative and socially constructed, both by the members of the EPAs who perceive it is not their role to go beyond regulation, as well as the government through their ideological stance on regulation.

The findings highlighted the importance of the UK and Irish EPAs working with a wide range of other public sector body partners to achieve the goal of environmental protection. Surprisingly, although partnership working was an approach to help garner a wider range of stakeholders, this activity is constrained by mandate and scope and is thus a factor that reinforces the constraints on the EPAs to support activity 'beyond compliance'. Each agency/partner has a clear purpose, remit and mandate, and they have to recognise each other's scope of activity has a constraining effect.

Beyond regulatory-scope limitations

The empirical evidence revealed two initiatives that appear not to be constrained by legislative frameworks or socially constructed narratives. Both of these initiatives are linked by their 'voluntary' nature and approach, between the EPAs and the organisations that engaged with and participated in the initiatives to support eco-innovation.

The first initiative VIBES, is led by Scottish Environmental Protection Agency (SEPA) and a wide range of partners, including the Scottish Government, Highlands & Islands Enterprise, Scottish Enterprise, Energy Saving Trust, Scottish Water, Zero Waste Scotland and the 20:20 Climate Group. The VIBES awards aim to encourage the efficient use of natural and man-made resources, enhance the competitiveness of businesses, improve environmental performance and support the wider goals of sustainable development including social benefits through community and staff involvement. VIBES, introduced in 1999, is a voluntary environmental awards programme. For the entrants and category winners it represents an opportunity to achieve recognition in terms of brand value, reputational value and marketing value through showcasing that they achieved compliance with environmental regulations and/or beyond compliance eco-innovation. These businesses demonstrate best-practice beyond compliance in putting environmentally responsible practices and innovation at the centre of their core economic activity. SEPA's central and proactive role in the VIBES scheme sends a number of important signals to the wider market. Firstly, the scheme provides an opportunity to achieve brand recognition. It reinforces that whilst environmental compliance is a minimum acceptable threshold, businesses should see the environment not as a burden but as an opportunity which can enhance their competitiveness. Secondly, the scheme

enables companies to gain recognition through their development of entrepreneurial and innovative environmental technologies. As a result of the ensuing media reporting of the businesses involved in the VIBES awards, many of these innovations will compete and grow successfully by solving environmental problems that subsequently contribute to stimulating sustainable economic growth.

The Northern Ireland Environment Agency launched an innovative voluntary programme called 'Prosperity Agreements' in early 2014. These agreements are designed to encourage businesses to go beyond compliance, to reduce environmental damage, as well as to protect future heritage. The intention of this initiative is to achieve the goal of greater societal prosperity and well-being. Prosperity agreements cover a wide range of issues including reduction of carbon emissions, reduction of waste, efficiency of water use and other resources, as well as efficiency in the supply chain with explicit criteria covering commitment, action and outcome. The first Prosperity Agreement was agreed in August 2014 with two businesses – Linden Foods Limited (a meat processing firm) and Linergy Limited (an energy-from-waste business). Since then the Northern Ireland Environment Agency has agreed a Prosperity Agreements with Larfarge Tarmac, John Thompsons and Sons, and Coca-Cola HBC Northern Ireland Ltd.

Theorizing VRL

From our research we can carve out a new construct for moral legitimacy, thereby extending Suchman's (1995) four forms of legitimacy: (i) consequential legitimacy (or

evaluations of outputs and consequences), (ii) procedural legitimacy (or evaluations of techniques and procedures), (iii) structural legitimacy (or evaluations of categories and structures), and (iv) personal legitimacy (or evaluations of leaders and representatives). We have identified from the empirical evidence the construct of 'voluntary reciprocal legitimacy' (VRL). VRL is defined here as the development of mutual trust between the regulator and business that results in agreements which generate a range of benefits for the regulator, the business and society. VRL goes beyond the legislative and regulatory frameworks by extending the regulator's and business's sphere of influence helping them to bring about change that protects the environment resource base whilst simultaneously creating new and previously untapped sources of wealth, a 'win-win' for all parties (see figure 3 below for the impact of VRL to create mutual trust through win/win' eco-innovation). To support eco-innovation it would require the EPAs to "challenge the prevailing wisdom and to take risks (Rainey and Esty, 2016, p 408). Let us see how VRL would work in the context of the other distinguished forms of legitimacies.

[Insert figure 3 about here]

Consequential legitimacy focuses on the accomplishment of activities which subsequently gain legitimacy through acceptance by society. Consequential legitimacy is understood in terms of "the technical properties of outputs that are socially defined and do not exist in some concrete sense that allows them to be empirically discovered" (Meyer et al., 1991, p 55). Society subsequently defines such characteristics. Within the aforementioned 'Prosperity Agreements' VRL can occur prior to the achievement of

legitimacy as the proposed outcomes are negotiated and agreed between the regulator and the business prior to any activity or recognition by society. For instance, within the VIBES Awards a business initiates an activity that they perceive as being beneficial to an environmental resource (i.e. recycling and waste management) for which they are subsequently recognised through an award scheme. Over time the VIBES awards scheme facilitates the development of mutual respect between the regulator, business and society, and may encourage other businesses to act in a similarly environmentally responsible manner.

Procedural legitimacy focuses on the replication of established practices which are also accepted by society (Scott, 1977). In both the 'Prosperity Agreements' and VIBES awards initiatives, the empirical evidence underpinning VRL highlighted the high levels of experimentation, trialing, and testing without any initial guaranteed success for the businesses or social acceptance. Such processes can be best understood as pre-discovery by society, and are undertaken in conditions of uncertainty and ambiguity (Sengers et al, 2016). The fundamental issue here is the creation of trust between the regulator and businesses to ensure that the eco-innovations pursued are recognised as 'prosocial' rather than just self-serving (for the company). The lack of certainty of outcome success arising from the experimentation, trialing and testing on the part of businesses is a key element of the trust-building. Regulators place trust in businesses that they will fulfil the environmental aims contained within the prosperity agreements. The importance of recognising experimentation, trialling and testing is supported by Porter and Van der Linde (1995-a), Wagner (2003), Johnstone et al., (2010) and Ambec et al, (2013), all

stressing the importance of building in flexibility and experimentation into regulations in order to promote eco-innovation.

Structural legitimacy focuses on the legitimacy bestowed by society to an organisation because of its characteristics that are worthy of societal support. In the case of businesses engaging with the VIBES awards, many of whom are SMEs; society is unaware of the structural characteristics of these SMEs. SEPA engages with this sector as the SME believes that their core activities are eco-innovative. VRL occurs as the regulator (SEPA) undertakes extensive research of the background, vision and activities of the SMEs. Two important aspects need to be highlighted here. First, societal affirmation may occur after publicity arising from the involvement with (and perhaps the winning of) a VIBES award. Such an approach helps the SME to gain legitimacy from society that they otherwise might not be able to acquire. Second, SMEs typically tend to be suspicious of EPAs and these awards are another feature of building mutual trust (EPA workshop participant).

Personal legitimacy emerges from the personal characteristics of organisational leaders, which is "relatively transitory and idiosyncratic" (Suchman, 1995: 581). Whilst recognising the leadership capabilities in organisations that engage with both the 'Prosperity Agreements' and the VIBES awards, these mutually beneficial outcomes are based on sustainability of actions. Such sustainability is beyond the individual and characteristics on any leader. Fundamental to VRL is the embedding of activities within

an organisation to ensure that sustainable leadership it is not transitory or reliant on a key individual.

VRL has emerged from our empirical evidence as the EPAs seek to move beyond compliance activity to support eco-innovations. The 'Prosperity Agreements' and the VIBES awards are exemplars of how business is willing and able to move beyond regulation, how business understands the benefits of eco-innovation, overcoming 'the policeman' perception of the regulator, and highlights how mutual trust between the regulator and business can produce societal benefits without prior legitimacy. This is important as the time lag between introducing eco-innovation and gaining societal awareness is by its nature long term. Compressing this time period, hence accelerating the speed of developing and implementing eco-innovations, can lead to a faster internalisation of negative externalities such as pollution, climate change and waste. This benefits not only businesses but society at large.

Conclusion

This paper explored ways in which environmental regulators may acquire both procedural and consequentialist legitimacy to advance their activities in promoting eco-innovation, which can subsequently be conducive to sustainable economic growth. We suggest the creation of a new form of legitimacy called Voluntary Reciprocal Legitimacy (VRL). This construct highlights how environmental regulators can harness award schemes and voluntary agreements to move business beyond regulatory compliance

activities and promote eco- innovation; two areas in which the regulators have traditionally lacked legitimacy. Underlying VRL is mutual trust between regulators and businesses, where mutual trust is accumulated through awards, such as VIBES and through mechanisms like Prosperity Agreements. Our contribution is two-fold. The first contribution is theoretical in extending Suchman's (1995) legitimacy framework with the development of a new category, voluntary reciprocal legitimacy, as well as applying it to a new context – environmental regulation and environmental or eco-innovation. The second contribution is our practical contribution, in identifying how regulators can overcome the legitimacy barrier of 'beyond regulatory compliance' to support environmental innovation. This contribution will help regulators overcome the 'policeman' perception often held by businesses. We now explore the implications of this contribution for both policy and practice.

Implications for policy

There are two inter-related demands in relation to how regulators go about acquiring VRL. First, is the importance of the regulators adopting schemes like the VIBES awards and Prosperity Agreements as a way of building voluntary reciprocal legitimacy to encourage and support eco-innovation by business. Second, but equally important, is the contribution of VRL highlighting the importance of the regulators working reduce the 'policeman' perception (whilst still maintaining their regulatory role) to open up a more fruitful relationship between them and business. By recognising the potential of such awards and schemes, regulators will be able to develop greater legitimacy. Currently legitimacy of EPAs is derived from legislation, helping them to achieve their goals and

make a positive contribution to natural resource protection, whilst supporting environmental innovation and sustainable economic growth.

Not all jurisdictions in the UK and Republic of Ireland legislatively or implicitly support such an approach. In some jurisdictions there is a paradox where constraints are placed on the EPAs as they are viewed as an unnecessary cost of enforcing environmental protection, whereas our study highlights EPAs' potential contribution to sustainable economic growth by going 'beyond compliance'. The discussion provides insightful analysis from the Scottish and Irish regulatory context, but it also reveals a deficit in other jurisdictions. In the case of the Environment Agency, beyond compliance activities and supporting innovation activities tend to be more restricted. There is an opportunity to understand how the lessons regarding VRL apply to the English regulator or, if they do not, why. Likewise, the Welsh regulator does not seem to have this strong focus on Prosperity Agreements or awards, but, has developed its sustainable natural resource management concept.

Implications for practice

The VIBES awards cuts across many industrial sectors and size of business. VIBES awards cover start-ups, small and medium sized enterprises (SMEs), national business and multi-national businesses'. Engaging with start-ups and SMEs is potentially an under-developed and untapped business sector. Engaging with SMEs is insightful as the VIBES awards appear to be a way of engaging with this harder-to-reach group of

businesses. Mutual trust will be a key factor in encouraging SMEs to see the value to their business of engaging with environmental innovation.

Further research is needed on other voluntary schemes in other contexts to determine their impact, whether they enhance trust and legitimacy between the regulator and regulated businesses, or not. Further research is needed to better understand the longitudinal impact, if any, of voluntary award schemes, such as the VIBES awards, as these may act as vehicle for other EPAs to support and encourage eco-innovation. Are the awards beneficial over the long-run? Do the awards make no long-run beneficial contribution? In addition, we have highlight the need for further research to identify how such approaches may be embedded in existing EPA organisational systems and approaches. Without such consistency in approaches there is likely to be confusion in the approach adopted by business, especially by entrepreneurial SMEs, when they are considering investing in eco-innovation activities. Without such consistency EPAs are likely to inadvertently create uncertainty, which negatively impact eco-innovative activities in the realm low carbon technology (Uyarra et al, 2016).

Funding

The research was funded by Scottish Environment Protection Agency under the Shared Agencies Regulatory Evidence Programme (ShARE) 109 Workstream.

References

Adams R, Jeanrenaud S, Bessant J, Denyer, D. and Overy, P. (2015) Sustainability-oriented innovation: a systematic review. *International Journal of Management Reviews*, 18: 180-205.

Allan C, Jaffe AB and Sin I. (2014) Diffusion of Green Technology: A Survey. *International Review of Environmental and Resource Economics*, 7 (1), 1-33.

Ambec S, Cohen MA, Elgie S, Lanoie P. (2013). The Porter Hypothesis at 20: Can Environmental Regulation Enhance Innovation and Competitiveness? *Review of Environmental Economics and Policy*, 7 (1) 2-22.

Bansal P and Clelland I. (2004) Talking trash: Legitimacy, impression management, and unsystematic risk in the context of the natural environment. *Academy of Management Journal* 47: 93-103.

Berry MA and Rondinelli DA. (1998) Proactive corporate environmental management: A new industrial revolution. *Academy of Management Executive* 12: 38-50.

Bioregional. (2016) *One Planet Living: the Ten Principles*. Available at: http://www.bioregional.com/oneplanetliving/.

Bray JN. (2000) *Collaborative inquiry in practice: Action, reflection, and making meaning*: Sage.

Butterfield LD, Borgen WA, Amundson NE, et al. (2005) Fifty years of the critical incident technique: 1954-2004 and beyond. *Qualitative Research* 5: 475-497.

Campbell JL, Quincy C, Osserman, J, Pedersen OK. (2013). Coding in-depth semistructured interviews? Problems of unitization and intercoder reliability and agreement. *Sociological Methods and Reviews*, 42 (3), 294-320.

Carmin J, Darnall N and Mil-Homens J. (2003) Stakeholder involvement in the design of US voluntary environmental programs: does sponsorship matter? *Policy Studies Journal* 31: 527-543.

Cashore B. (2002) Legitimacy and the privatization of environmental governance: How non–state market–driven (NSMD) governance systems gain rule–making authority. *Governance* 15: 503-529.

Cohen MJ, Brown HS and Vergragt P. (2013) *Innovations in sustainable consumption: New economics, socio-technical transitions and social practices*: Edward Elgar Publishing.

Denzin NK and Lincoln YS. (2000) *Handbook of Qualitative Research*. London: SAGE Publications.

Eckersley R. (2007) Ambushed: The Kyoto Protocol, the Bush administration's climate policy and the erosion of legitimacy. *International Politics* 44: 306-324.

Eden S. (1999) 'We have the facts'—how business claims legitimacy in the environmental debate. *Environment and Planning A* 31: 1295-1309.

Environment Agency. (2015) Creating a better place corporate plan summary 2014 London: UK Government.

EU Climate and Energy Framework, 2030, European Commision, Brussels. https://ec.europa.eu/clima/policies/strategies/2030_en

Fischer C, Parry IWH and Pizer WA. (2003) Instrument choice for environmental protection when technological innovation is endogenous. *Journal of Environmental Economics and Management* 45: 523-545.
Flanagan JC. (1954) The critical incident technique. *Psychological bulletin* 51: 327.
Francesch-Huidobro M. (2012) Institutional deficit and lack of legitimacy: the challenges of climate change governance in Hong Kong. *Environmental Politics* 21: 791-810.
Francesch-Huidobro M, Lo CW-H and Tang S-Y. (2012) The local environmental regulatory regime in China: Changes in pro-environment orientation, institutional capacity, and external political support in Guangzhou. *Environment and Planning A* 44: 2493-2511.
Guba, E. G. Lincoln, Y. S. (1981). *Effective evaluation: Improving the usefulness of evaluation results through responsive and naturalistic approaches*. San Francisco, CA, US, Jossey-Bass.
Herbert S. (2014) Fear and loathing in the San Juan Islands: endangered orcas and the legitimacy of environmental law. *Environment and Planning A* 46: 1781-1796.
Johnstone N, Haščič I and Popp D. (2010) Renewable energy policies and technological innovation: evidence based on patent counts. *Environmental and resource economics* 45: 133-155.
Kesidou E and Demirel P. (2012) On the drivers of eco-innovations: Empirical evidence from the UK. *Research Policy* 41: 862-870.
King N. (1994) The qualitative research interview. In: Cassell CS, G. (ed) *Qualitative methods in organizational research.* London: Sage Publications, 14-36.
Kronsell A. (2013) Legitimacy for climate policies: politics and participation in the Green City of Freiburg. *Local Environment* 18: 965-982.
Levinthal DA March JG (1993). The myopia of learning, Strategic Management Journal, 14 (S2), 95-112.
Meyer JW, Rowan B, Powell W, et al. (1991) The new institutionalism in organizational analysis. *The new institutionalism in organizational analysis*.
Miles MB and Huberman AM. (1994) *Qualitative data analysis: an expanded sourcebook*: Sage Publications.
Miles MB, Huberman AM and Saldaña J. (2014) *Qualitative data analysis : a methods sourcebook*.
OECD. (2015) *Towards Green Growth?*: OECD Publishing.
OECD. (2017) *Green Growth Indicators 2017*: OECD Publishing.
Oltra V, Kemp R, De Vries FP (2010). Patents as a measure for eco-innovation.
International Journal of Environmental Technology and Management, 13 (2), 130-148.
Polzin, P. von Flotow, P. and Klerkx, L. (2016). Addressing barriers to eco-innovation: Exploring the finance mobilisation functions of institutional innovation intermediaries, *Technological Forecasting & Social Change*, 103, 34-46.
Porter ME and Van der Linde C. (1995-a) Green and competitive: ending the stalemate. *Harvard Business Review* 73: 120-134.
Porter ME and Van der Linde C. (1995-b) Toward a new conception of the environment-competitiveness relationship. *The journal of economic perspectives* 9: 97-118.
Saldaña J. (2015) *The Coding Manual for Qualitative Researchers*: SAGE Publications.

SEPA. (2014) 21st Century Regulation: SEPA's Draft Regulatory Strategy. Scottish Environment Protection Agency.
SEPA (2016) One planet prosperity - Our regulatory strategy. Scottish Environment Protection Agency.
Simon HA (1972). Theories of bounded rationality, *Decision and Organisation*, 1 (1), 161-176.
Simon HA (1991). Bounded rationality and organizational learning, Organization Science, 2 (1), 125-131.
Strauss AL and Corbin JM. (1990) *Basics of qualitative research: grounded theory procedures and techniques,* Newbury Park; London: Sage.
Suchman MC. (1995) Managing legitimacy: Strategic and institutional approaches. *Academy of management review* 20 (3): 571-610.
Symon G. (1998) Qualitative research diaries. In: Symon GC, C. (ed) *Qualitative methods and analysis in organizational research.* eds ed. London: Sage Publications, 94-117.
Tremblay MA. (1982) The key informant technique: A non-ethnographic application. In: Burgess RG (ed) *Field Research: a Sourcebook and Field Manual.* London: Routledge, 98-104.
Uyarra, E. Shapira, P. Harding, A. (2016). Low carbon innovation and enterprise in the UK: Challenges of a place-blind policy mix. *Technological Forecasting & Social Change*, 103, 264-272.
Wagner, M. (2003). The Porter Hypothesis Revisited: A Literature Review of Theoretical Models and Empirical Tests. Luneburg: Centre for Sustainability Management.
Wesselink A, Paavola J, Fritsch O, et al. (2011) Rationales for public participation in environmental policy and governance: practitioners' perspectives. *Environment and Planning A* 43: 2688-2704.
Yin, R. K. (2009). *Case study research: Design and methods* (4th ed), London: Sage Ltd.

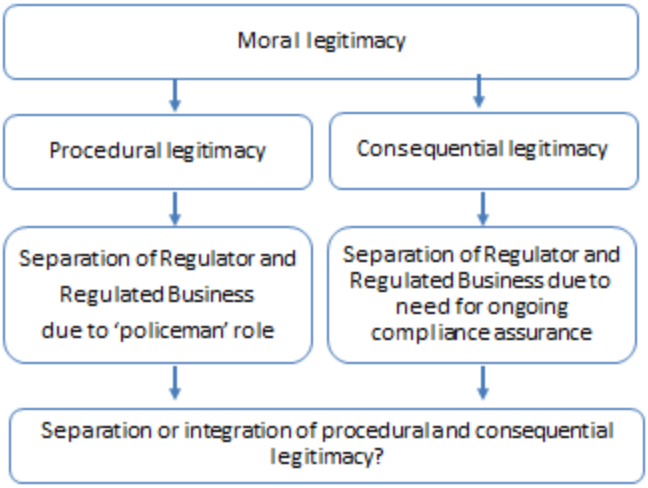

Figure 1: Separation of procedural and consequentialist legitimacy

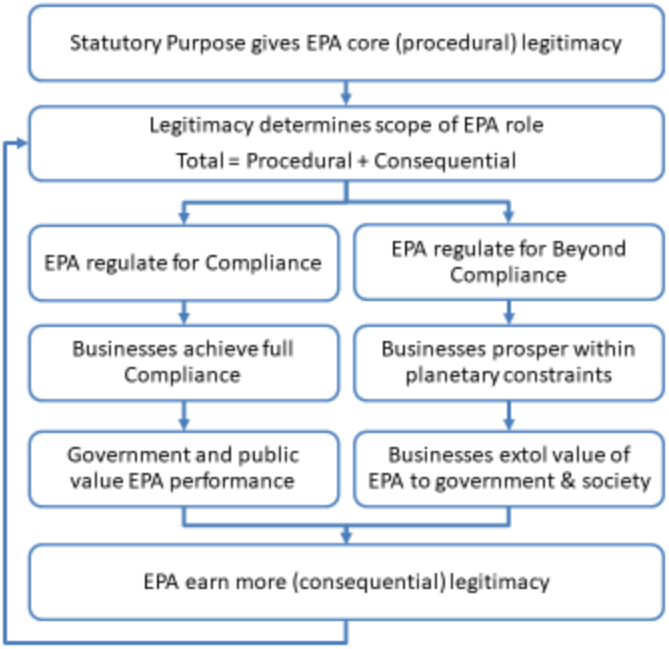

Figure 2: Potential link between procedural and consequentialist legitimacy

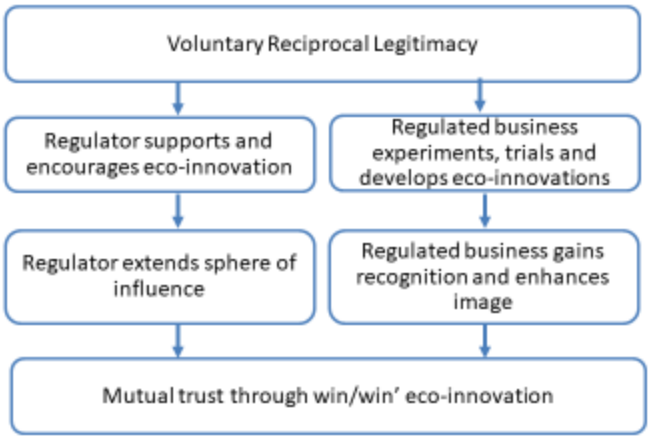

Figure 3: Impact of VRL

Share 109 Project Interview Schedule

	Interviewee:	**Organisation:**	**Venue:**	**Date:**	**Time:**
Introductions and Background to Research Project (One Planet Framework) (Bioregional, 2016)	Introduce to interviewee *One Planet Framework* and rationale behind project				
Question 1 (General role of EPAs in sustainable economic growth) (SEPA, 2014; Environment Agency, 2015)	How can regulatory agencies like "X" promote sustainable economic growth?				
Question 2 (Organisational innovation) (Oltra et al., 2010)	How can "X" work with the businesses that it regulates to encourage them to adopt sustainable innovations?				
Question 3 (Types of regulatory instrument) (Fischer et al., 2003; Kesidou and Demirel, 2012; Porter and Van der Linde, 1995-b)	How effectively can good business decisions that are good for the environment be stimulated through direct regulation?				
Question 4 (System-level sustainable innovation) (Adams et al., 2015)	Could "X" operate green technology schemes/incubators for green entrepreneurs? Could "X" help companies in its region develop export markets for its environmental innovations?				
Question 5 (Future perspectives) (OECD, 2015; OECD, 2017)	What future opportunities do you think "X" could take advantage of, given current trends and developments?				
Question 6	Who else would you recommend that we could interview?				
Reflections on Interview					